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09/787,748	03/21/2001	James M. Evans	3847-67823	4685

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EXAMINER
WESSMAN, ANDREW E

ART UNIT	PAPER NUMBER
1742	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

TP

Office Action Summary	Application No. 09/787,748	Applicant(s) EVANS ET AL.	
	Examiner Andrew E Wessman	Art Unit 1742	

-- The MAILING DATE of this communicati n appears on the cov r sheet with th c rrespondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-32 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-32 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1-32 have been submitted for examination.

Claim Objections

2. Claims 10, 11, 21, and 28 are objected to because of the following informalities: In claims 10 and 11, the word "comprising" has been omitted from the claim, most likely due to typographical error. Also, in claims 21 and 28, after the word group the word "consisting" has been omitted, so that the phrase should read "the group consisting of". Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 26 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no disclosure anywhere in the application of an alloy containing beryllium in an amount of 0.04-0.07 wt%, and this value runs contradictory to applicant's disclosure of beryllium being present in amounts of less than 0.003 wt%.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. The term "reduced" in claim 1 is a relative term which renders the claim indefinite. The term "reduced" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

8. In claim 15, the claim is directed to a "modified die-castable aluminum alloy", but does not provide any basis for determining what constitutes a modified alloy. All existing alloys, by definition, are metal compositions modified by the addition of certain percentages of metal additions. Simply claiming an alloy that has been "modified" provides no specificity as to what is being claimed.

9. In claim 32, it is not clear what constitutes a "known aluminum alloy". Clarification of this term is required.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 15-18, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishi et al. (U.S. Patent No. 4,976,918).

Nishi et al. anticpates the invention substantially as claimed. Nishi et al. discloses (see abstract) an aluminum die-casting alloys containing:

2-8 wt% Magnesium

0-3 wt% Manganese

0-1 wt% Silicon

0-1 wt% Copper

0-0.5 wt% Iron

0-0.3 wt% Zinc

0-0.3 wt% Titanium

And the remainder aluminum with other optional additions.

Because claim 1 of the present invention recites the term of "less than 0.003% by weight beryllium", beryllium can be absent in the alloy as disclosed by Nishi et al.

In regards to the features of claims 15-18, wherein the alloy contains less than 0.6 wt% iron and manganese in a percent by weight higher than the percentage by weight of iron, Nishi et al. discloses an alloy comprising less than 0.5 wt% iron, which overlaps the substantial majority of applicant's claimed range, and also discloses that manganese can be from 0-3 wt%, the majority of that range being greater than the maximum allowable amount of iron.

In regards to the features of claim 32, Nishi et al. discloses providing aluminum alloys wherein the iron content is in a range typical of known alloys (see tables 1, 3, and 5 for the amounts of iron in the Nishi et al. alloys and comparable commercial alloys) and the manganese content has been adjusted to 1.0-2.0 wt% and also discloses (col.

6, lines 47-54) heating the alloy to an appropriate casting temperature and then die casting the alloy. Nishi et al. does not teach explicitly the removal of the part from the die, however, this is a necessary step that would implicitly be present in such an operation and it is known to remove parts from the die after they are cast in order to use the part. Therefore, Nishi et al. inherently teaches the removing step.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 2-6, 12-14, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi et al. (U.S. Patent No. 4,976,918) in view of Evans et al. (U.S. Patent No. 5,573,606).

The teachings of Nishi et al. are discussed in above paragraph 10.

Nishi et al. does not teach the addition of beryllium to aluminum alloys.

Evans et al. teaches (col. 2, line 47 to col. 3, line 8) the addition of less than 0.003 wt% beryllium by weight. Evans et al. teaches that beryllium is useful for preventing the oxidation of magnesium in the aluminum alloys, but due to its toxicity the inclusions can desirably be of less than 0.003 wt% beryllium.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add to the aluminum alloy of Nishi et al. beryllium in amounts less than 0.003 wt% as suggested by Evans et al. to prevent oxidation of magnesium

and to avoid the toxicity of using high amounts of beryllium, as taught by Evans et al. (col. 2, line 47 to col. 3, line 8).

In regards to the features of claim 2, Nishi et al. teaches an alloy that can have 2.5-4.0 wt% magnesium. Nishi et al. does not, however, teach an aluminum alloy with greater than 17% elongation.

Evans et al. discloses (see table in col. 7, lines 35-50) aluminum alloys of similar composition to the claimed invention having elongation values of over 20%. One of ordinary skill in the art at the time the invention was made would have expected alloys of Nishi et al. in view of Evans et al. to have elongation values of over 17%, in light of the values given in the table of Evans et al. because of its compositions being similar to those of the claimed invention.

In regards to the feature of claim 3, wherein the alloy comprises less than 0.45 wt% silicon, Nishi et al. teaches an alloy wherein silicon is less than 1.0 wt%, the scope of which encompasses that of the claimed invention.

In regards to the feature of claim 4, wherein the alloy comprises less than 0.10 wt% copper, Nishi et al. teaches an alloy wherein copper is less than 1.0 wt%, encompassing the scope of the claimed invention.

In regards to the features of claim 5, the scope of Nishi et al. teaching silicon less than 1.0 wt% encompasses the claimed invention range of 0.45 wt% silicon or less. Nishi et al. does not, however, teach an alloy having at least 17% elongation.

Evans et al. discloses (see table in col. 7, lines 35-50) aluminum alloys of similar composition to the claimed invention having elongation values of over 20%. One of

ordinary skill in the art at the time the invention was made would have expected alloys of Nishi et al. in view of Evans et al. to have elongation values of over 17%, in light of the values given in the table of Evans et al. because of its compositions being similar to those of the claimed invention.

In regards to the features of claim 6, wherein the magnesium content of the alloy is between 2.5 and 4.0 wt%, Nishi et al. teaches a magnesium content of from 2-8 wt%, the scope of which encompasses the claimed invention.

In regards to the features of claim 12, the composition of magnesium, manganese, iron, and silicon is well within the scope of Nishi et al. Evans et al. teaches (col. 7, lines 35-50) that in alloys with such composition as that of Nishi et al., the value for the elongation would be expected to be above 17%, as the table shows elongation values that are over 20% for beryllium values of less than 0.003 wt%. Therefore, it would have been obvious to one of ordinary skill in the art that for alloys with compositions taught by Nishi et al., the elongation of at least 17% taught by Evans et al. would have been expected.

In regards to the feature of claim 13, wherein the alloy further comprises 0.05-0.1 wt% copper, Nishi et al. teaches aluminum alloys containing less than 1.0 wt% copper, the scope of which encompasses the composition of the claimed invention.

In regards to the feature of claim 14, wherein the alloy further comprises less than 0.1 wt% zinc, Nishi et al. teaches aluminum alloys containing less than 0.3 wt% zinc, the scope of which encompasses the composition of the claimed invention.

In regards to the features of claim 19, Nishi et al. teaches an aluminum alloy whose composition encompasses the claimed ranges for magnesium, manganese, iron, silicon, and copper.

Nishi et al. does not teach an aluminum alloy with a yield strength of greater than 11.95 kgf/mm^2, or an elongation of at least 18%.

Evans et al. teaches (col. 7, lines 35-50) that in alloys with such composition as that of Nishi et al. in view of Evans et al., the value for the elongation would be expected to be above 17% and the value of the yield strength would be expected to be above 11.95 kgf/mm^2, as the table shows elongation values that are over 20% and yield strengths that are over 12 kgf/mm^2 for beryllium values of less than 0.003 wt%. Therefore, it would have been obvious to one of ordinary skill in the art that for the alloys of the composition taught by Nishi et al., the strength would have been expected to be at least 11.95 kgf/mm^2 and the elongation would have been expected to be at least 18%, as taught by Evans et al.

In regards to the features of claim 20, wherein the alloy comprises manganese in an amount of about 1.1 wt%, Nishi et al. teaches an alloy wherein manganese is present in an amount from 0-3 wt%, encompassing the amount of the claimed invention.

14. Claims 7-10 and 28-31 rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi et al. in view of Evans et al., and further in view of Witters et al. (U.S. Patent No. 5,151,136).

The teachings of Nishi et al. in view of Evans et al. are discussed in above paragraph 6.

Nishi et al. in view of Evans et al. does not teach alloys with less than 1.75 wt% magnesium or with 4.2-5.0 wt% copper.

Witters et al. teaches (col. 2, lines 28-29) that 0-5 wt% magnesium may be added to aluminum alloys to in order to increase the alloy strength and decrease alloy density (col. 3, lines 8-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add 0-5 wt% of magnesium as disclosed by Witters et al. to an aluminum alloy such as one taught by Nishi et al. in view of Evans et al., because any amount between 0 and 5 wt% of magnesium would be effective for increasing the alloy strength and decreasing the alloy density, as taught by Witters et al. (col. 3, lines 8-15).

In regards to the features of claims 8 and 29, wherein zinc is added to the alloy in amounts less than 0.1 wt%, Nishi et al. teaches adding zinc to aluminum alloys in amounts of less than 0.3 wt%, encompassing the claimed range of less than 0.1 wt%.

In regards to the features of claims 9 and 31, wherein titanium is added to the alloy in amounts less than 0.2 wt%, Nishi et al. teaches adding titanium to aluminum alloys in amounts of less than 0.3 wt%, encompassing the claimed range of less than 0.2 wt%.

In regards to the features of claim 11, wherein copper is added to the alloy in amounts less than 0.2 wt%, Nishi et al. teaches using copper in amounts of less than 1.0 wt%, which encompasses the claimed range of less than 0.2 wt%.

In regards to the features of claim 10 and 28, wherein copper is added in amounts of 4.2-5.0 wt%, Nishi et al. in view of Evans et al. does not teach the addition of copper in this amount.

Witters et al. teaches (col. 2, line 66 to col. 3, line 7) the addition of 3.0 to 6.5 wt% copper in aluminum alloys for the purposes of creating an alloy with good fracture toughness, strength, corrosion resistance, and stress corrosion cracking resistance.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add copper in amounts between 3.0 and 6.5 wt% as taught by Witters et al. to the aluminum alloy of Nishi et al. in view of Evans et al., in order to provide the alloy with improved fracture toughness, strength, corrosion resistance, and stress corrosion cracking resistance as taught by Witters et al.

In regards to the features of claim 30, wherein silicon is present in the alloy in amounts less than 0.05 wt%, Nishi et al. teaches the addition of silicon to aluminum alloys in amounts of less than 1.0 wt%, the scope of which includes that of the claimed invention.

15. Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi et al. in view of Evans et al., and further in view of Japanese Patent No. 60050142 A.

The teachings of Nishi et al. in view of Evans et al. are discussed in above paragraph 6.

Nishi et al. in view of Evans et al. does not teach an aluminum alloy with 6.5-7.5 wt% of silicon.

Japanese Patent No. 60050142 A, henceforth referred to as JP '142, teaches (page 2, col. 2, oral translation from USPTO translator) that 4-12 wt% silicon may be added to the aluminum alloy in order to improve die castability and reduce cracking of the castings by improving the flow characteristics of the metal.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add 4-12 wt% silicon as taught by JP '142 to the alloy of Nishi et al. in view of Evans et al. in order to improve the flow characteristics of the metal to and improve castability, as taught by JP '142.

In regards to the features of claim 22, wherein zinc is added to the alloy in amounts less than 0.1 wt%, Nishi et al. teaches adding zinc to aluminum alloys in amounts of less than 0.3 wt%, encompassing the claimed range of less than 0.1 wt%.

In regards to the features of claim 23, wherein copper is added to the alloy in amounts less than 0.2 wt%, Nishi et al. teaches using copper in amounts of less than 1.0 wt%, which encompasses the claimed range of less than 0.2 wt%.

In regards to the features of claim 24, wherein titanium is added to the alloy in amounts less than 0.2 wt%, Nishi et al. teaches adding titanium to aluminum alloys in amounts of less than 0.3 wt%, encompassing the claimed range of less than 0.2 wt%.

16. Claims 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi et al. in view of Evans et al. and futher in view of Japanese Patent No. 60050142 A as applied to claims 21-24 above, and further in view of Witters et al.

Nishi et al. in view of Evans et al. and further in view of JP '142 does not teach less 0.24-0.45 wt% or 0.4-0.7 wt% magnesium.

Witters et al. teaches (col. 2, lines 28-29) that 0-5 wt% magnesium may be added to aluminum alloys to in order to increase the alloy strength and decrease alloy density (col. 3, lines 8-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add 0-5 wt% of magnesium as taught by Witters et al. to an aluminum alloy such as one taught by Nishi et al. in view of Evans et al., because any amount between 0 and 5 wt% of magnesium would be effective for increasing the alloy strength and decreasing the alloy density, as taught by Witters et al. (col. 3, lines 8-15).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew E Wessman whose telephone number is (703)305-3163. The examiner can normally be reached on Monday through Friday, 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (703)308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

AEW
June 6, 2002

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